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China Report

SCIENCE AND TECHNOLOGY

No. 182

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CHINA REPORT

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APPLIED SCIENCES

AERIAL TEAMS PROVIDE DATA FOR IMPROVED MAPS

Lanzhou GANSU HUABAO [GANSU PICTORIAL] in Chinese No 5, 1982 pp 4-5

[Article by Lo Wenke [5012 2429 4430] and Zhu Yenming [2612 1693 2494]: "The Eagles of Aerial Surveying"]

[Text] Working round the clock in the skies of the motherland, a team of aerial surveyors who provide geographic and cartographic information for China's socialist, economic, and defense construction.

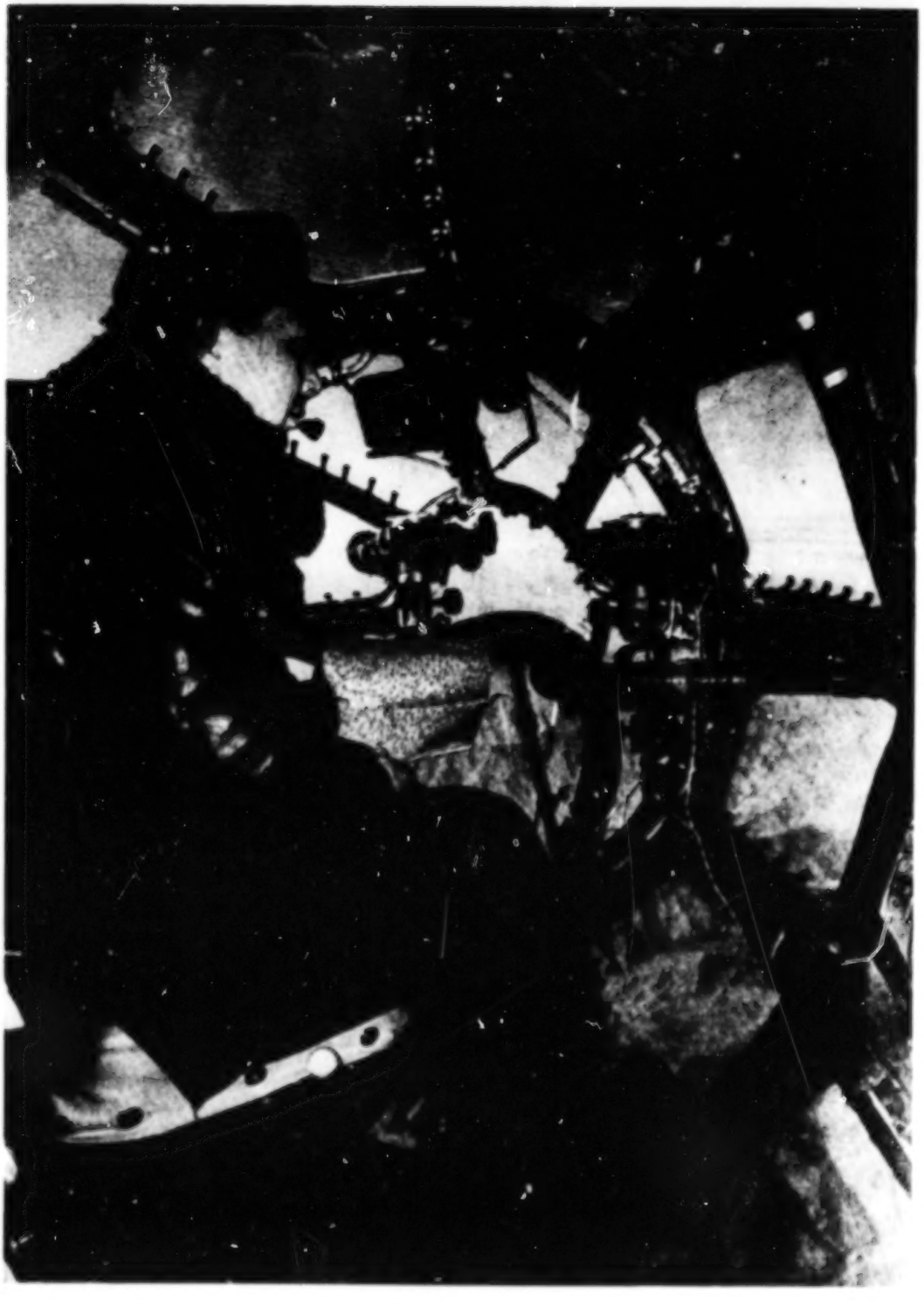
Shortly after its organization, this aerial survey team was given a difficult assignment to survey an important region. It was a region with complex terrain, high mountains and deep valleys, and the surveying aircraft must fly at low altitude through many uncalibrated peaks. Faced with this dangerous and difficult task, the young "eagles of aerial surveying" were put to the test, like young swallows learning to fly. However, armed with determination and courage, they ultimately established numerous air routes over the mountains and successfully accomplished their mission.

During the past 2 decades, the aircraft of the aerial survey team have cast their shadows all across this land: from the snowcovered forests of the northeast to the Yungeui highlands in the southwest; from the towering Kunlun mountains to the south sea islands; and from the Gobi Desert to the "Roof of the World."

Flying across thousands of miles of blue sky, the agile "eagles of aerial surveying" have just one goal in mind: to construct newer and better maps for the modernization of the motherland.

Preflight checkout.

Tension mounts during aerial photography.



Navigating.

3012
CSO: 4008/19

APPLIED SCIENCES

SUCCESS OF 'Y-7' ENCOURAGES PROPONENTS OF INDEPENDENT AIRCRAFT INDUSTRY

Beijing HANGKONG ZHISHI [AEROSPACE KNOWLEDGE MAGAZINE] in Chinese No 10, 6 Oct 82 pp 1-5

[Article by Xie Chu [6200 4342]: "A Flight in the 'Y-7'"]

[Text] In early April of this year, at the Zhanguei zhuang Airport in Tianjin, the Chinese-made "Y-7" aircraft successfully passed its most difficult tests before design certification; single-engine full-load take-off and landing tests. The success of this flight test not only makes a significant contribution to single-engine take-off and landing techniques but also paves the way for the "Y-7" to be certified for service.

After the flight test, the "Y-7" was flown to Beijing from Tianjin. At the invitation of the comrades at the Xi'an Airplane Company, we arrived at an airport in the suburbs of Beijing for a look at Chinese-made short-range passenger aircraft.

Inside the airport lounge, we were first treated to a colored video recording, which showed the reception for the "Y-7" test pilots by leading comrades of the State Council on 16 April of this year. Comrades Geng Biao and Zhang Aiping expressed their satisfaction with the aircraft's superior performance during the flight test and congratulated all the personnel of the aviation industry and civil aviation for their participation and achievements in this flight test. Declared comrade Zhang enthusiastically: "The 'Y-7' has now grown into a 'handsome young man'!"

The recording also showed the exciting scenes from the flight test. The chief engineer of the Xi'an Airplane Company and leader of the flight test team, Comrade Yi Zhibin gaves us a description of the development process of the "Y-7." According to him, "Y-7" is a twin-engine turboprop airplane designed to serve the transportation needs of feeder routes; its development was personnaly approved by the late Premier Zhou Enlai. At present, a total of nine "Y-7's" have been produced, two of which were used for strength tests, one was used in a fatigue test, and three were used in flight tests; a large amount of data was obtained from these tests. This aircraft has accumulated over 1,600 flight hours in more than 3,600 flights. The fuselage fatigue test is still continuing, with more than 52,000 test cycles completed.

It has been said that aeronautics is the "flower of modern industry." The successful development of the "Y-7" reflects the overall capability and standard of China's industrial and production technology. A passenger aircraft of the same class as the "Y-7" has approximately 600,000 parts, and each part must be of high quality. To produce so many parts requires thousands of different materials. With the cooperation of several hundred organizations all over the country, thousands of items were produced for the "Y-7"; the suppliers include the metallurgical, chemical, electronic, structural, mechanical, textile, and other industries. Therefore, it can be said that the "Y-7" is a product of socialist cooperation; its success is a result of supporting efforts from many industries.

Directly in front of us appeared a light-weight, agile-looking aircraft. Its white body was shining under the sunlight. On the 23 meter long fuselage were painted dark blue stripes and the eye-catching insignia of Chinese Civial Aviation; on the 8-meter-high vertical tail a colorful 5-star red Chinese flag made us feel proud to know that it is a Chinese-made aircraft. Spectators surrounding the airplane included comrades from the Central Committee.

The Y-7 is a medium-sized aircraft with a capacity of approximately 50 passengers. The cross section of the fuselage is composed of two circular arcs with different diameters; it has an all-metal semi-rigid structure made of frames and purlins covered with an aluminum skin. The wing span is over 29 meters; it is a cantilevered single wing located on top of the mid-section of the fuselage. Two 2,900-hp turboprop engines (WJ5A-1) are installed in the engine housings underneath the port and starboard wing sections.

The high wing design is commonly used on this type of feeder-route transport aircraft. This design not only increases lift, but also provides more distance between the engine/propeller and the ground. This reduces possible damage to the engine due to dust and debris because feeder-route aircraft must have the capability to take off and land on dirt runways.

We boarded the "Y-7" through a rear entrance on the port side of the fuselage. The rear section of the fuselage contains the luggage compartment and the lavatory. The main passenger cabin has soft, cushioned seats arranged four to a row, with a 0.4 meter wide aisle in the middle. With 12 rows and 48 seats, the distance between rows is 0.78 meter; with 13 rows and 52 seats, the distance between rows is reduced to 0.72 meter. The aisle is carpeted. The distance from floor to ceiling is 1.86 meters. The passenger cabin and the cockpit are both pressurized and equipped with air-conditioning and pressurization systems which ensure proper temperature and pressure inside the cabin when flying at altitudes of 5000-6000 meters.

After we boarded the aircraft, the cabin door was shut, and this aircraft, designated model B-421, was ready to take us on a sightseeing tour over the nation's capital.

As the "Y-7" (with a maximum take-off weight of more than 21 tons) left the runway and started climbing at a speed of 180 kilometers per hour, the host invited us into the cockpit. The pilots who took part in this flight test were comrades

from the 8th Brigade of the Lanzhou Office of the Bureau of Civil Aviation. Pilots Zhang Yun and Cheng Yuanyong were awarded 1st degree citations for successfully performing the single-engine take-off and landing tests. Right now they were concentrating on piloting the aircraft on its upward climb. The sea-level climb rate of the "Y-7" is 7 meters per second; in only a few minutes we reached an altitude of 3,000 meters. Through the front and side windows in the cockpit we saw the green fields and sparkling rivers surrounding the capital. On top of the cockpit was an observation window. The engineer, the navigator, and the radio operator were also busy with their jobs. They were apparently excited about their mission to operate a Chinese-made aircraft. The cockpit was filled with an atmosphere of harmony. Our speed at this moment was approximately 480 kilometers per hour.

When this reporter returned to the passenger cabin, he saw the other passengers enjoying the aerial view through the side windows. Everyone was excited over being able to ride in a Chinese-made aircraft. Over the years during his travels at home or abroad, this reporter had been a passenger on more than ten different airplanes, but none of them were built in China. Although he had been in Chinese-made planes such as trainers, the "Zhi-5," the "Y-5," and Chinese-made gliders, they were not regular air transports. Riding in a Chinese-made airliner was indeed a new experience for him.

The "Y-7" is a feeder-route aircraft. The so-called feeder routes refer to civil transportation routes which range between 200 kilometers and 500 kilometers and connect small to medium-sized cities. Since the 60's feeder-route aviation has increased rapidly in many countries; in particular, a number of Third World countries devoted special efforts to developing feeder-route transportation. Since the aircraft used on feeder routes are less expensive, more efficient, and require relatively simple airports to operate from, they are used extensively. But compared to the large turbofan jet passenger planes, the development of feeder-route aircraft has been rather slow. Most of the 50-seat aircraft currently being used belong to the first-generation feeder-route aircraft such as the Dutch F-27 "Friendship," the Canadian DHC-7, and the Soviet "AN-24." On the basis of technological standards, the "Y-7" is also considered a first-generation aircraft. At present, several countries are actively engaged in the development of second-generation aircraft which will have improved efficiency, lower noise level, and higher speed.

It is worth noting that certain countries such as Brazil and Indonesia are making a concerted effort to industrialize and to cultivate their aeronautical manufacturing capability; consequently, they are developing feeder-route aircraft either on their own or in cooperation with other countries, and in most cases they made significant progress. China is such a large country that it must be able to achieve independence in developing its own aeronautical industry. The successful development of the "Y-7" is a beginning in this direction.

Now the "Y-7" was gradually touching down on the runway. Under a take-off weight of 21 tons, the take-off distance is approximately 580 meters. The landing distance is approximately 500 meters.

After leaving the aircraft, this reporter arranged an interview with the chief of the flight technology team, Comrade Zhang Qinliang, who is responsible for all the technical aspects of the flight test. He had participated in both single-engine test flights, and has made significant contributions to the exploratory work involved in the test. He was awarded a first degree citation for his outstanding performance. Sitting on a sofa in one corner of the airport lounge, we began our conversation.

According to Zhang, because of China's vast territory, complicated terrain, and fluctuating climate conditions, a feeder-route transport must be able to operate under a wide range of geographic and weather conditions. The two 2,900-hp engines of the "Y-7" are designed to meet this requirement. But whether the actual performance meets design specifications must be verified through flight tests. Therefore, the flight test team had flown the airplane to every corner of the country. With the exception of Taiwan and Tibet, the "Y-7" has been to 28 different airports located at various provinces, cities, and autonomous regions. .It had been to northern airports with temperatures 30°C below zero, and to Wuhan, and southern Hunan airports with temperatures reaching 38.5°C. It had also flown to the hot and humid Nanjing'Shanghai region and to the Guelmo airport in the Gobi at 3,000 meters above sea level. Furthermore, it had been flight-tested on dirt runways at Hanzhong and Xianyang. These tests had demonstrated that the performance of "Y-7" can fully meet the requirements of its intended use.

When asked about the future of "Y-7" production, Zhang gave the following reply. Although the "Y-7" is designed primarily for feeder-route transportation of passengers and cargo, it can also be used for such missions as resouce exploration, aerial photography, air drops and rescue. Today, China's feeder-route aircraft are quite old and should be replaced, another need which can be met by this aircraft. Therefore, a significant number of orders for the "Y-7" are still required. Research and production departments will continue to make improvements and modifications to accommodate user needs. Obviously, as a member of the technical team, he fully acknowledged the responsibilities on his shoulders.

At this point, we all recalled the days back in the early 50's when we first entered the newly established Beijing Aeronautical Institute. The school had no lecture halls, no laboratories, and the students attended classes in a tent during winter. A posted sign on the campus which said, "Welcome, future aeronautical engineers!" was intended to boost the spirits of the students. Now, almost 30 years later, we are still traveling in foreign planes around the country. This is indeed quite disheartening.

After Liberation, the government and party strongly encouraged the development of the civil air transport industry in this country. As a result, significant progress was made, particularly after the 11th Central Committee Conference, when economic development improved the standard of living of the population and stimulated people's interest in travel. During the last 2 years, the total volume of civil transportation has been growing at an average rate of 21 percent annually. In 1981 the total volume reached 535 million ton-km, a 25-percent increase over 1980; it has become the fastest growing segment of the transportation industry (including railroads, highways, and waterways). Currently,

Chinese Civil Aviation has established more than 170 air routes with almost 600 flights per week, and more than 100 airports around the country (except Taiwan) are being used. Among the domestic air routes, 30-50-seat feeder-route aircraft account for more than 60 percent of the total number of flights, and carry approximately one-fifth of the total passenger-km volume of domestic travel.

According to statistics, China's volume of domestic air transportation currently ranks 15th in the world, on approximately the same as in England. If the current growth rate is sustained, at the end of this decade China will rank 7th or 8th in the world, and catch up with France. However, China is a large country with vast territory and a large population. The estimated capability of air transportation may not be able to meet the needs of projected socialist construction. At present, Chinese Civil Aviation has approximately 400 aircraft, of which over 100 are passenger planes with more than 30 seats. But in 1980 the passenger volume carried by air transports was only one-sixtieth of the total volume.

Compared to advanced nations in the world, China is also lagging behind by a wide margin. For example, in the United States, the number of feeder-route aircraft used in 1965 was 361; by 1980 it had increased to 1,333. In 1980 only one Chinese in 286 had traveled once by air, whereas in 1978 every American had traveled an average of 1.2 times by air. Currently, China's civil transportation is in a strained situation; increasing the transportation capacity of civil aviation undoubtedly will relieve the pressure on railroad and waterway transportation. In a large country such as ours, we must rely on ourselves to solve the problems of air transportation. For this reason, the future of domestic transport airplanes is very bright.

[Technical notes on the "Y-7"]
Wing span 29.25 meters, length 23.708 meters, height 8.56 meters, width of fuselage 2.9 meters, wing area 75 m^2; main wheel base 7.9 meters, front wheel base 7.9 meters; maximum take-off weight 21,000-22,000 kg, empty weight 14,235 kg, maximum payload 4,700 kg, cruising speed 480 km/hr, sea level climb rate greater than 7 meters per second, ceiling 8,750 meters, single-engine ceiling 3,400 meters, maximum fuel capacity 4,000 kg (4,800 kg with auxiliary fuel tank).

3012
CSO: 4008/8

GRAPHITE COMPOSITE MATERIAL TECHNOLOGY ON 'DAUPHIN' HELICOPTER STUDIED

Beijing GUOJI HANGKONG [INTERNATIONAL AVIATION] in Chinese No 10, 5 Oct 82 pp 44-46

[Article by Li Ercheng [2621 3643 2052]]

[Text] During the past decade, the application of composite materials on aerospace structures has been advancing at an astonishing pace. At present, composite materials are used not only on many secondary components and the tail section of an aircraft, but also on certain important components and moving parts. The new materials, Kevlar, and graphite have been used on all sections of aircraft. On the "Dauphin" helicopter built by the French Aerospatiale Company, composite materials are used extensively; some of the applications, e.g., on the main rotor and the main blade housing, are quite unique and are representative of typical applications of composite materials on modern aircraft. The main purpose of this article is to describe the use of graphite on the "Dauphin" helicopter.

I. Application of Graphite Composite Material on "Dauphine" Helicopter

Since graphite is a material with high strength, high rigidity, and good fatigue characteristics (see Fig. 1) it is generally used on parts which have high strength requirement and are subject to alternating load conditions.

Specifically, graphite composite material is used on the following parts of the "Dauphin": the horizontal stabilizer, lateral vertical tails, suspension support arm, cargo floor, float, blade skin, blade housing support arm, variable torsion arm, vertical tail (and sheathing duct), transmission deck, and control mechanisms. The use of graphite composite materials reduces the weight of the "Dauphin" and lowers its cost (estimated to be one-half to one-third lower). It also improves its safety and fatigue characteristics.

The "Dauphin" helicopter allegedly uses more composite materials than other helicopters (see Fig. 2). At the end of 1979, the "Dauphin" N helicopter contained 25 percent composite material (another measure is that the ratio between composite parts and riveted parts is 87:13). By 1987, the percentage is expected to reach 30. The benefits of using graphite composite material on the "Dauphin" N are summarized in Table 1.

II. Types of Graphite Composite Materials

The graphite composite materials used on the structures of the "Dauphin" helicopter can be divided into two types (based on the temperature range of solidification):

1. solidification temperature of 180°C

1) V108, 45 percent, G827, thickness 0.2 mm, uni-directional fiber

2) V108, 48 percent, G803, thickness 0.2 mm, bi-directional fiber

2. solidification temperature of 120°C

1) M10, 45 percent, G827, thickness 0.2 mm, uni-directional fiber

2) M10, 45 percent, G803, thickness 0.3 mm, bi-directional fiber

3) M10, 45 percent, G814, thickness 0.25 mm, bi-directional fiber

4) TISSU, 145.2, 54 percent, G814

5) Kelvar, 145.2, 60 percent, 980

6) Fiberglass, 145.4, 50 percent, 664

7) HOMEX

Four different types of resin film and liquid glue are used:

180°C high temperature resin film, REDUX BSL319, used on the leading edge of vertical tail, stabilizer, and cover skin

120°C resin film, Marmco 1113.06, used on connections of reinforced ribs

120°C heat expansion glue, BSL212, used on connections between reinforced ribs and cover skin

120°c liquid glue, HYSOLEA 9309, 3NA, can be used under normal temperature on metal joints

The graphite fiber cloth used in the production is a pre-soaked single-layered cloth covered with green plastic protective film and rolled into cylindrical shape. It is kept in a cold storage room with temperature maintained at -18°C. Therefore, for purpose of long-distance shipping, a liquid nitrogen low-temperature compartment would be required.

III. Shaping Procedure of Graphite Composite Material

1. Based on the characteristic of graphite fiber, various documents of production instruction, fabrication procedure, quality varification are available to the operator. A typical operating procedure is shown in Fig. 3.

2. Laying Material: The laying of graphite fiber cloth, which is covered with a protective layer, is generally done manually according to the dimensions of a blueprint or a template. In some cases it is placed directly on a mold and excess material is cut off with a thin blade. For parts produced in large quantities, a thin plate blast mold is used; for parts with multiple layers and complicated shapes, a numerically controlled laser device is sometimes used in order to meet the special requirements for cutting the fibers.

3. In the case of folded layers, the fibers must be laid strictly according to the order of the folds. To facilitate the process, the fibers are numbered sequentially.

4. Procedure for Shaping the Tail Sheathing Duct

1) The cover skin of the sheating duct consists of two (left and right) sections; the dimensions of each section are larger than 2m x 2m in length and width, with a hole in the center. There are two sets of shaping molds, which can be constructed from cast aluminum or from 4 mm aluminum plates with adjustable supports (see Fig. 5).

The graphite fiber cloth is first laid on the molding and sealed with plastic film; then it is evacuated to a vacuum of P = -0.8 bar, and heated in an oven until it is soldified.

2) The leading edge of the vertical tail (see Fig. 6) has a sandwiched honeycomb structure. Its shaping device consists of two halves of cast aluminum molding blocks. Inside the mold is an inflatable heat-resistant silicon-rubber bag. To facilitate operation the frame of the mold can be rotated or tilted. The rubber bag is inflated to a pressue of approximately 5 bar; and the oven is heated to a temperature of 180°C for about 1 hour.

3)The sheathing duct tube is made of graphite fiber cloth with a cylindrical sandwiched honeycomb structure (see Fig. 7). It is shaped using a cast-aluminum mold which is evacuated and heated to a temperature of 120°C to achieve solidification.

4) The plates and small parts of the vertical tail are straight and flat with reinforced strips in the middle. Generally they are shaped using a mold placed on a thermo press. The mold consists of a lower section and an upper cover plate and is stuffed with plastic blocks.

5) The tube axle is shaped by first molding graphite fiber cloth into a tube and four pairs of axle tiles (each tile is made from two halves), and then assembling the tiles and the tube. The shaping device consists of two halves of aluminum press mold and a heat-resistant rubber core rod. The tube axle must be subject to ultrasonic test and bending test. A diagram of the tube axle is shown in Fig. 8.

6) The assembly of various parts of the sheating duct is accomplished by glueing together the leading edge, the left and right cover skin, and the sheating duct tube. The assembly frame has the following features:

a) it is 3m long, 2.4m wide, and 1.7m high; it has a protable design for easy transportation.

b) it has the local surface positioning feature to ensure tight fit between glueing surfaces.

c) it has a tubular pressing device operated by a compressed-air system. The supply pressure is 6 bar.

d) the solidification temperature is 120°C.

IV Shaping Equipment

The equipment used for shaping graphite composite-material parts are as follows:

1) The thermo press (with heating platform) is 120-360 tons; its unit pressure can reach 10 bar, and the temperature is 200°C±2°C.

2) The oven is 5m long, 3m wide, and 2 m high. The interior wall has nozzles for evacuation; the maximum temperature is 200°C, and the temperature recording device has an error of ±2°C. The parts and components of the tail sheating duct are solidified using the oven rather then the thermo press.

3) The vacuum system and the compressed-air system used in the procedure are generally off-the-shelf equipment selected for each specific application.

4) To simplify the shaping process and to ensure the quality of adhesion, special-purpose silicon-rubber bags and blocks are used extensively. The blocks are heat-resistant and thermo-elastic; they are part of the molding equipment. The rubber bags in most cases are designed specially to conform with the shape of a particular product.

Figure 1. Comparison of Fatigue Strength of Different Materials

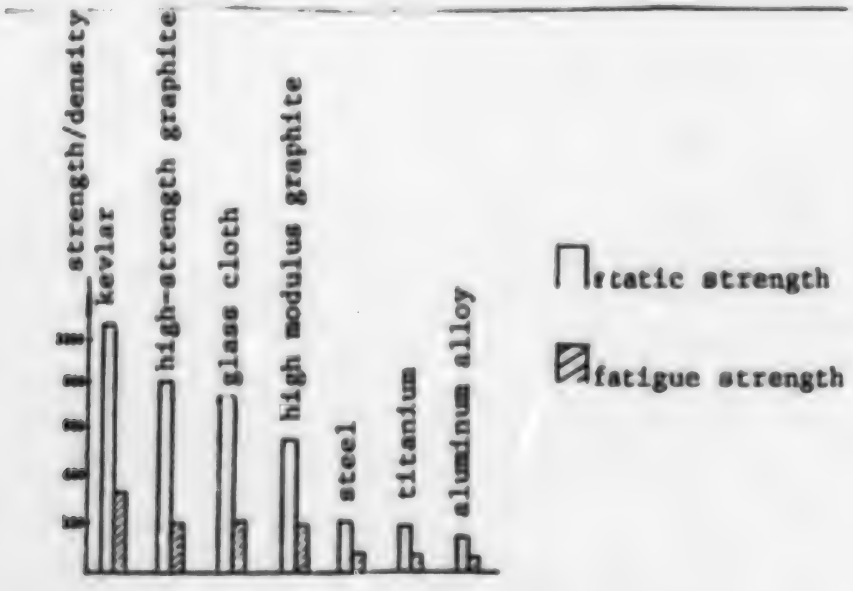


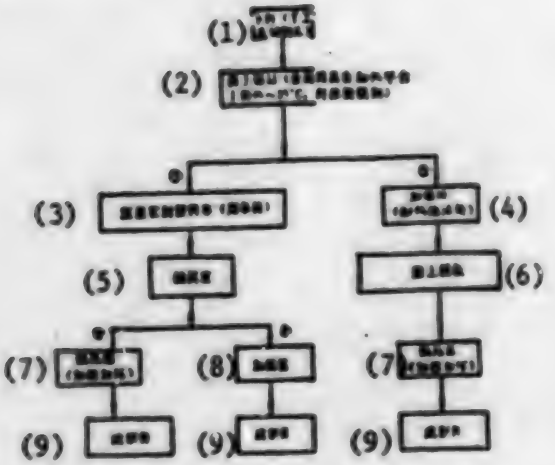
Figure 2. Distribution of Composite Materials on Dauphin Helicopter

Table 1.

Typical Benefits of Using Composite Materials

Part	Comparison with Metal Structure	
	Weight reduction	Cost reduction
Horizontal stabilizer and side vertical tail	30 percent	10 percent
Suspension support arm	45 percent	15 percent
Float	25 percent	50-60 percent
Blade housing support	0	—
Variable torsion arm	45 percent	20 percent
Vertical tail	15 percent	10-20 percent
Blade cover skin	0	—
Transmission and control mechanism	35-45 percent	—

Figure 3. Typical Operating Procedure



Key:

1. Laying material (manual or cutting bed)
2. Pre-heat metallic mold to 35°C on heating platform and add mold-removing coating
3. Cover with sealing plastic cloth (using single mold)
4. Add heat-resistant foam blocks
5. Evacuate
6. Cover with mold plate
7. Thermo press (heat and compress)
8. Oven
9. Shaped product

Figure 4. Simplified Diagram of Tail Sheathing Duct

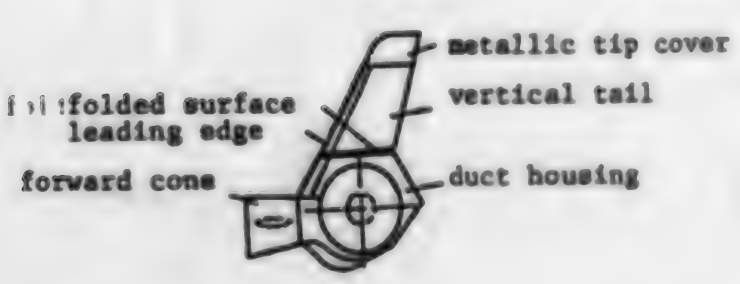


Figure 5. Shaping Mold for Sheathing Duct Cover Skin

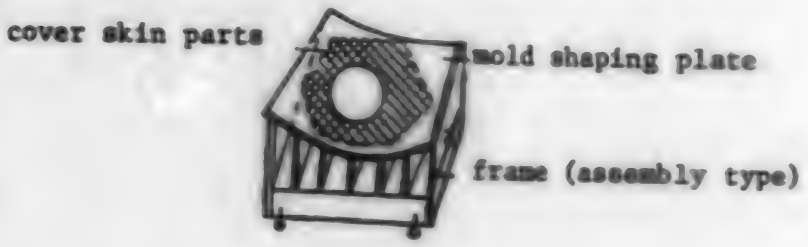


Figure 6. Shaping of the Leading Edge of Vertical Tail

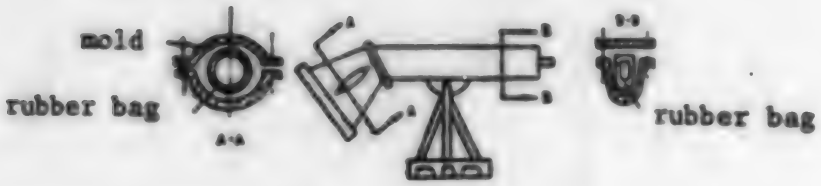


Figure 7. Sheathing Duct Cylindrical Part

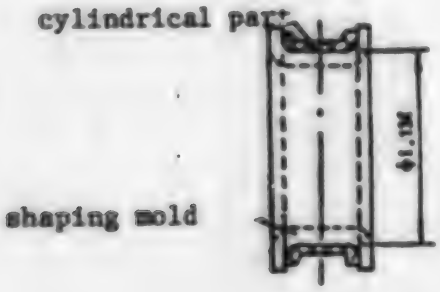
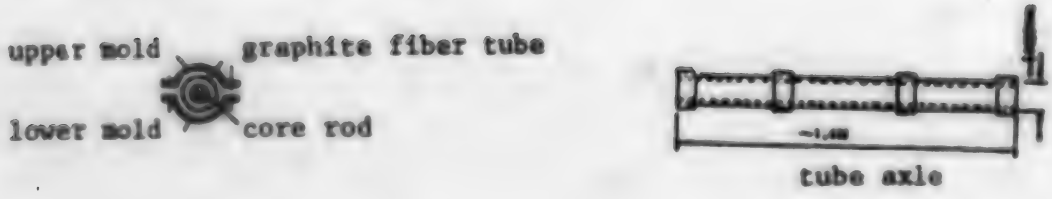


Figure 8. Tube Axle



3012
CSO: 4008/15

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ORG: All of Changchun Automobile Research Institute

TITLE: "A Fuel-saving Plan for Jiefang CA-10B and CA-10C Truck Engines"

SOURCE: Changchun QICHE JISHU [AUTOMOBILE TECHNOLOGY] in Chinese No 9, 25 Sep 82 pp 45-53

ABSTRACT: More than 900,000 Jiefang trucks have been manufactured throughout the years. It is the major type of car for highway and urban transport in China and the ones currently on the road will remain important for socialist construction in the future. They are, however, old and backward and consume a great deal of fuel. Under the current movement of advocating fuel conservation, aside from urgently preparing for model change, it is also necessary to improve the motive power property of the existing trucks to reduce fuel consumption. Following a great deal of research work on the CA-10B,and CA-10C engines of Jiefang trucks, the authors devised 5 plans to change the compression ratio of the aluminum cylinder head, to modify the intake and exhaust pipes, and to install the fuel-saving carburetor 2$_1$SB$_1$, etc. Preliminary tests of these plans demonstrate definite fuel-saving results. Some of these new engine models, the economy model CA-10CJ, the CA-10CT, and the CA-10CG have been officially in production in 1982. The major structural parameters of the experimental cylinder heads, intake and exhaust pipes, and carburetors are reported and the test results discussed.

6248
CSO: 4009/30

AUTHOR: None

ORG: Machine Industry Automation Society, China Society of Mechanical Engineering

TITLE: "Automatic Production Line For Single Operation Forming of Ceramic Pipe Semi-hard Plastic Successfully Formulated and Certified"

SOURCE: Beijing JIXIE GONGYE ZIDONGHUA [MACHINE-BUILDING INDUSTRY AUTOMATION] in Chinese No 4, 1982 inside backcover

ABSTRACT: Under the guidance and concern of the municipal planning committee, economic committee, science committee, and the bureau of chemical engineering, and with the support of agencies such as the Northwest Academy of Construction Designing, the Mudanjiang Chemical and Ceramics Plant and the Mudanjiang Municipal Research Institute of Machines succeeded, after several years of research, in creating an automated production line for the single-operation forming of ceramic pipe semi-hard plastic. A certification conference was held in Mudanjiang City on 25-27 Aug this year to inspect the work process. This automated line is composed of 7 machines and a 4G-80 automatic control system. The line is capable of automatically pressing into form, automatically separating from the mold, and automatically cutting, repairing, turning, moving to another machine, etc. Judging from the observed condition of operation, this production line is a great improvement of the present hot and stuffy work environment of this product. The production line will greatly reduce labor intensity as well as improving production efficiency and product quality. The delegates of the conference believed that the successful formulation of the production line contributes to the automation of China's ceramic industry. The direction is definitely correct.

6168

CSO: 4009/33

AUTHOR: YU Fang [6735 2455]

ORG: None

TITLE: "Brief News"

SOURCE: Beijing WUZI GUANLI [MATERIALS MANAGEMENT] in Chinese No 10, 1982 p 24

ABSTRACT: A National Materials Departments Financial Management Work Conference was most recently held in Beijing. It was attended by 190 persons representing bureaus of materials of all provinces, cities, and autonomous regions, all units subordinate to the National Bureau of Materials, the Ministry of Finance, and the People's banks. The major task of the conference was to implement the spirit of this year's Conference of Heads of National Bureaus of Materials and the recently held National Financial Management Work of Enterprises Conference called by the Ministry of Finance, to improve material circulation economic benefits, to summarize the experience in material exchange and enterprise finance work, and to organize and reinforce the financial management of materials enterprises. During the conference, representatives of 10 units introduced their experiences. Comrade YU Xiaogu [0151 0876 6253] delivered the summarization speech and Comrade LUO Zhiqing [5012 1807 0615] delivered a report.

6168
CSO: 4009/40

AUTHOR: None

ORG: Gas Dynamic Laser Group, Institute of Mechanics, Chinese Academy of Sciences

TITLE: "Experimental Studies on a Gas Dynamic Laser with Narrow Throat and High Area-Ratio Grid Nozzles"

SOURCE: Beijing LIXUE XUEBAO [ACTA MECHANICA SINICA] in Chinese No 5, 1982 pp 496-499

TEXT OF ENGLISH ABSTRACT: This paper describes a combustion-driven CO_2 gas dynamic laser with a throat height of 0.5 mm and an area-ratio of 30 grid nozzles, and presents some experimental results. The behavior of flow and the location of shock waves in the optical cavity were observed. The variation in small-signal gain G_0 with CO_2 or H_2O contents was measured and compared with the experimental data from similar equipment of nozzle throat height 0.8 mm and area-ratio 17. Some advantages are obvious for the narrower throat height and higher area-ratio GDL, i.e., the G_0 can be increased by a factor of 50 percent and the H_2O contents may be increased from 1 percent to 5 percent.

AUTHOR: SHEN Xiong [3088 3574]
LIAO Husheng [1675 3275 5116]

ORG: Both of the Department of Engineering Mechanics, Qinghua University

TITLE: "Measurements of Highly Turbulent Recirculating Flow by Applying a Frequency Shift LDV System"

SOURCE: Beijing LIXUE XUEBAO [ACTA MECHANICA SINICA] in Chinese No 5, 1982 pp 505-511

TEXT OF ENGLISH ABSTRACT: This paper describes a LDV system with a frequency shift device in which two acousto-optic cells are used to produce the required frequency shift.

By applying this system, measurements of the highly turbulent recirculating flow in a plane, two-dimensional duct with a single-step expansion were carried out for Reynolds numbers from 2750 to 8250. Two data processing methods, one analogue method and the other digital, were employed in order to obtain the profiles of mean velocity and turbulent intensity. Velocity probability distribution and probability density functions are also displayed by the digital data processor.

The experiments show that measurements of various complex flows, such as highly turbulent, recirculating and oscillatory flow, can be realized with such a frequency shift LDV system.

9717
CSO: 4009/32

AUTHOR: CHEN Bingquan [7115 3521 5425]

ORG: Tongji University

TITLE: "On the Human Factor in Total Quality Control"

SOURCE: Beijing ZHILIANG GUANLI [QUALITY CONTROL] in Chinese No 5, 1982 pp 11-12

ABSTRACT: In enterprise management, problems of quality control is often regarded as problems of technical management, to be responsible for by such technological experts as the chief engineer, engineers, etc. In reality, they are not purely technical problems. For example, 2 technicians of the same skill may not produce products of the same quality. This is to say that quality is not entirely determined by technical factors. A certain highly skillful technician of a certain plant suddenly produced unqualified products to cause the plant to lose several thousand yuan. When the reasons were analyzed, it was discovered that certain condition of the plant caused a depressed feeling about production and he was not able to concentrate on his work. This incident belongs to the human factor to be discussed in the paper. The paper introduces the functional equation of $Q = f(T \cdot R)$; where Q is the quality of products; T the technical level of workers; R the seriousness of the attitude of responsibility of the workers toward the quality of the products. The ways of improving this functional relationship are to pursue: (1) The benefit principle; (2) The principle of distribution according to labor contribution; (3) The principle of a system of responsibilities; (4) The principle of combining ideological education with material benefits. These principles are briefly expounded.

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CSO: 4009/39

AUTHOR: PEI Ronggang [5952 2837 6921]
QIAN Jin [6197 6651]

ORG: None

TITLE: "X-ray Residual Stress Test Technical Symposium Held in Handan City"

SOURCE: Shanghai WUSUN JIANCE [NONDESTRUCTIVE TESTING] in Chinese No 5, 1982 p 23

ABSTRACT: The Handan City Nondestructive Testing Instrument Plant was asked by the North China Group of the National Stress Test Technology Association to sponsor the X-ray Residual Stress Testing Technique Symposium. It was held in the afternoon of 5 May 82 in Handan City and attended by more than 70 specialists, engineers, and lecturers representing more than 50 research institutes, schools of higher education, and related factories. The symposium invited LI Jiabao [2621 1367 1405] of Shenyang Research Institute of Metals, Chinese Academy of Sciences, YANG Yuxing [2799 0060 5281] of Shanghai Jiaotong University, RAN Qifang [0373 0796 5364] of Zhengzhou Research Institute of the Ministry of Machine Industry, and ZHAO Hexiang [6392 6320 4382] of Handan City Nondestructive Testing Instrument Plant to serve as lecturers. The symposium lasted 15 days, during which time problems of application of x-ray residual stress testing technique in China's defense, research, and machine industries were discussed. Experiences in its applications were exchanged, and knowledge relating to the properties, applications, maintenance, and repair of stress testing instruments disseminated. The symposium has not only helped China's nondestructive testing technicians to understand and grasp the technology but also promoted the development of the technology in the country.
6168
CSO: 4009/37

HOR: CHU Mingxiang [0443 6900 4382]

: None

LE: "Brief News of Association Activity"

RCE: Beijing QIZHONG YUNSHU JIXIE [HOISTS AND CONVEYANCES] in Chinese No 9, ep 82 pp 36, 58

TRACT: An Industrial Material Transport Technology Exchange Meeting was organized the Hubei Provincial Material Transport Association on 22-25 May this year. It held in Hubei Provincial Automobile Manufacturing Plant No 2, and Wuhan College Water Transport Engineering was in charge of arranging the meeting and the Auto-ile Manufacturing Plant No 2 took care of its preparation. The participants in-ded 30+ delegates representing industries, schools of higher education, and de-ning and management agencies within the province. Additionally, the National erial Transport Association also sent representatives. Discussions at the meet- include: (1) The work condition of caternary suspension on the car assembly line; Preliminary application result, long range prospect, and the economic benefit of ti-story parts warehouse center for supplying more than 570 types of parts of the assembly line at the Automobile Manufacturing Plant No 2; (3) Condition of mate-l transport system in Automobile Manufacturing Plant No 2 and suggestions for its rovement and reconstruction. During the meeting, the delegates visited the Cen-l Test Laboratory of the 7 branch-factories of assembly, body shop, engine shop, . The delegates saw that most parts no longer touch the floor in the machining ocess. By observing the practice at the plant, they understood more than ever importance of scientific transport methods in preserving the quality of parts, ucing cost of products, and improving labor productivity in manufacturing industries.

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